

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (previously presented): A cartridge for nucleic acid separation and purification which comprises: a cylindrical main body formed of a cylindrical part and a bottom part having an opening; and a nucleic acid-adsorptive porous membrane held on the bottom part,

a rim part of the nucleic acid-adsorptive porous membrane being held by a molding material forming the cylindrical part of the cylindrical main body,

wherein the cylindrical part is integrally formed with the bottom part and the nucleic acid-adsorptive porous membrane so as to prevent breakage and poor sealing of the nucleic acid-adsorptive porous membrane, and

the rim part of the nucleic acid-adsorptive porous membrane is compressed so that voids in the rim part of the membrane disappear,

which cartridge is produced by:

inserting a bottom member and the nucleic acid-adsorptive porous membrane into a cavity of an injection molding die wherein the nucleic acid-adsorptive porous membrane is placed in the bottom member providing the bottom part which is one of two parts that sandwich and hold the nucleic acid-adsorptive porous membrane; and

injecting the molding material into the cavity to form the cylindrical part of the cylindrical main body wherein a portion forming the cylindrical part which is the other of the two parts that sandwich and hold the nucleic acid-adsorptive porous membrane is integrated with the bottom member while the nucleic acid-adsorptive porous membrane is sandwiched and held

between the cylindrical part and the bottom part, and the rim part of the nucleic acid-adsorptive porous membrane is held and compressed by injection pressure of the molding material forming the cylindrical part of the cylindrical main body.

2. (original): The cartridge for nucleic acid separation and purification according to Claim 1, wherein the bottom member further comprises a cylindrical discharge part communicating with the opening of the bottom part.

3. - 4. (canceled).

5. (previously presented): The cartridge for nucleic acid separation and purification according to claim 1, wherein the rim part of the nucleic acid-adsorptive porous membrane is compressed to a thickness of 10% to 70% of an initial thickness.

6. (original): A method for producing a cartridge for nucleic acid separation and purification which comprises: a cylindrical main body formed of a cylindrical part and a bottom part having an opening; and a nucleic acid-adsorptive porous membrane held on the bottom part, comprising:

a step of placing the nucleic acid-adsorptive porous membrane on the bottom part provided in a bottom member, and placing the bottom member and the nucleic acid-adsorptive porous membrane in a cavity of an injection molding die;

a step of pressing a core pin to the nucleic acid-adsorptive porous membrane while holding the nucleic acid-adsorptive porous membrane with a rim part of the nucleic acid-

adsorptive porous membrane protruding from a periphery of an end face of the core pin, and closing the injection molding die;

a step of injecting a molding material into the cavity, forming the cylindrical part of the cylindrical main body, and at the same time sandwiching and holding the rim part of the nucleic acid-adsorptive porous membrane between the molding material and the bottom part; and

a step of removing a casting from the injection molding die.

7. (original): The method for producing a cartridge for nucleic acid separation and purification according to Claim 6, wherein the core pin compresses and holds the nucleic acid-adsorptive porous membrane so that a thickness of the nucleic acid-adsorptive porous membrane becomes 10% to 70% of an initial thickness.

8. (original): The method for producing a cartridge for nucleic acid separation and purification according to Claim 6, wherein an end part of the core pin is in a cone shape which tapers from a circular rim to a center of the end part.

9. (original): The method for producing a cartridge for nucleic acid separation and purification according to Claim 6, wherein the rim part of the nucleic acid-adsorptive porous membrane protruding from the periphery of the end face of the core pin is compressed by injection pressure of the molding material injected into the cavity until voids inside are collapsed.

10. (original): The method for producing a cartridge for nucleic acid separation and purification according to Claim 6, wherein the rim part of the nucleic acid-adsorptive porous membrane protruding from the periphery of the end face of the core pin is compressed to a thickness of 10% to 70% of an initial thickness by injection pressure of the molding material injected into the cavity.

11. (original): The method for producing a cartridge for nucleic acid separation and purification according to Claim 6 capable of producing a number of cartridges for nucleic acid separation and purification at the same time, wherein

the injection molding die has a plurality of cavities;

the bottom member with the nucleic acid-adsorptive porous membrane being placed therein is inserted in each of the plurality of cavities; and

the plurality of cavities communicate with one another.

12. (previously presented): A cartridge for nucleic acid separation and purification comprising a cylindrical body with a first opening and a second opening and having a nucleic acid-adsorptive porous membrane held in the cylindrical body, in which separation and purification of nucleic acid are conducted by passing a sample solution containing nucleic acid by pressurized gas from the first opening to the second opening to allow the nucleic acid to be adsorbed to the nucleic acid-adsorptive porous membrane, wherein:

the cylindrical body comprises: a cylindrical main body having a bottom part supporting the nucleic acid-adsorptive porous membrane; and a discharge part connecting a bottom part opening formed in the bottom part and the second opening;

the bottom part has a bottom face and a plurality of protrusions formed on the bottom face;

at least a part of a top part of each protrusion supports the nucleic acid-adsorptive porous membrane, and the top part of each protrusion slopes down to the discharged part in a radial direction of the bottom part; and

a closer portion of the nucleic acid-adsorptive porous membrane to the bottom part opening is made more displaced towards the discharge part during use.

13. (original): The cartridge for nucleic acid separation and purification according to Claim 12, wherein the plurality of protrusions are a plurality of ribs radially extending from the bottom part opening.

14. (original): The cartridge for nucleic acid separation and purification according to Claim 13, wherein the top part of the rib is rounded.

15. (original): The cartridge for nucleic acid separation and purification according to Claim 12, wherein the bottom face has a slope so that a closer portion of the bottom face to the bottom part opening is displaced more towards the discharge part.

16. (original): The cartridge for nucleic acid separation and purification according to Claim 12, wherein edges and corners present in an inner surface of the cartridge for nucleic acid separation and purification are rounded.

17. (original): The cartridge for nucleic acid separation and purification according to Claim 12, wherein the nucleic acid-adsorptive porous membrane is held with a rim part thereof being compressed.

18. - 21. (canceled).

22. (currently amended): ~~The~~ A cartridge for nucleic acid separation and purification ~~according to Claim 18, comprising a cylindrical body with a first opening and a second opening and having a nucleic acid-adsorptive porous membrane held in the cylindrical body, in which separation and purification of nucleic acid are conducted by passing a sample solution containing nucleic acid by pressurized gas from the first opening to the second opening to allow the nucleic acid to be adsorbed to the nucleic acid-adsorptive porous membrane, wherein:~~

the cylindrical body comprises: a cylindrical main body having a bottom part supporting the nucleic acid-adsorptive porous membrane; and a discharge part connecting the bottom part opening formed in the bottom part and the second opening;

a thickness of a part forming the second opening of the discharge part is 0.2 mm or more;

a diameter of the second opening is 1.0 mm or more;

an outer diameter of the part forming the second opening is 1.4 mm or more;

an angle formed by an end face of the discharge part and an outer wall surface of the discharge part is 105° or less;

an end face of the discharge part is in a shape of a funnel with a portion closer to the second opening having a larger opening diameter; and

~~wherein~~ resin hydrophilicity of ~~an~~ the end face and ~~an~~ the outer wall surface of the discharge part is enhanced.

23. (currently amended): ~~The~~ A cartridge for nucleic acid separation and purification ~~according to Claim 18, comprising a cylindrical body with a first opening and a second opening and having a nucleic acid-adsorptive porous membrane held in the cylindrical body, in which separation and purification of nucleic acid are conducted by passing a sample solution containing nucleic acid by pressurized gas from the first opening to the second opening to allow the nucleic acid to be adsorbed to the nucleic acid-adsorptive porous membrane, wherein:~~

the cylindrical body comprises: a cylindrical main body having a bottom part supporting the nucleic acid-adsorptive porous membrane; and a discharge part connecting the bottom part opening formed in the bottom part and the second opening;

a thickness of a part forming the second opening of the discharge part is 0.2 mm or more;

a diameter of the second opening is 1.0 mm or more;

an outer diameter of the part forming the second opening is 1.4 mm or more;

an angle formed by an end face of the discharge part and an outer wall surface of the discharge part is 105° or less;

an end face of the discharge part is in a shape of a funnel with a portion closer to the second opening having a larger opening diameter; and

~~wherein~~ at least one lug member for guiding the bubbles is provided on ~~an~~ the end face of the discharge part.

24. - 25. (canceled).